



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Product

EnergyPlus

Technology

EnergyPlus is a building energy simulation program for modeling building heating, cooling, lighting, ventilating, and other energy flows. *EnergyPlus* builds on the most popular features and capabilities of two predecessor programs: the Building Loads and System Thermodynamics (BLAST) program (developed by the ERDC/CERL), and the DOE-2 program (developed by the U.S. Department of Energy [DOE]). *EnergyPlus* includes many innovative simulation capabilities such as time steps of less than an hour, modular systems and plant integrated with heat balance-based zone simulation, multizone air flow, thermal comfort, and photovoltaic systems.

Problem

During design phase of a building, many decisions are made that affect the energy consumption and cost over the life-cycle of the facility. Changes made early in the facility design process can yield a more cost-effective, energy-conservative building. Due to the complexity of building interactions, a computerized means for predicting energy consumption and system performance is necessary.

Expected Cost To Implement

EnergyPlus software and documentation is available for download through the Internet free of charge from the DOE.

Benefits/Savings

In a DOE News Release of 12 April 2001 announcing the software's availability, U.S. Secretary of Energy Spencer Abraham stated that the "*EnergyPlus* computer simulation program will assist designers and building owners dramatically lower energy use in buildings." *EnergyPlus* dramatically improves the simulation of whole-building approaches in design, planning, and construction, and opens new doors for energy savings, cost savings and indoor environmental quality. The program allows users to calculate the impacts of different heating, cooling, and ventilating equipment, and with various types of lighting and windows to maximize building energy efficiency and occupant comfort. Users can simulate the effect of window blinds, electrochromic window glazings, and complex daylighting systems—features not seen in earlier DOE software.



Status

EnergyPlus was officially released on 12 April 2001. The current version, 1.4.0, was released 12 October 2006. A complete listing of current program features and capabilities is available through the Internet at URL:

<http://www.eere.energy.gov/buildings/energyplus/>

EnergyPlus is a standalone simulation engine without a "user friendly" graphical interface. *EnergyPlus* reads input and writes output as text files. Several private sector companies are developing more user-friendly, graphical, and domain specific interfaces for *EnergyPlus*.

EnergyPlus also supports the International Alliance for Interoperability–Industry Foundation Classes (IAI-IFC) compliant software programs that allow Computer Aided Design/Drafting programs to interface directly with domain applications. *EnergyPlus* has an IFCToIDF application (input data file conversion utility) that is distributed with the rest of the program.

ERDC POC

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Distribution Source

EnergyPlus software is available for download free of charge from the U.S. Department of Energy through the Internet at URL:

<http://apps1.eere.energy.gov/buildings/energyplus/getting.cfm>

Available Documentation

Documentation and reference material (*Input/Output Reference, Output Details and Examples, Engineering Reference, Getting Building Geometry from CAD, Testing and Validation, Module Developer's Guide, Interface Developer's Guide, Program Standard, and Research Papers and Articles*) are available for download free of charge from the U.S. Department of Energy at URL:

<http://apps1.eere.energy.gov/buildings/energyplus/documentation.cfm>

Available Training

GARD Analytics, Inc. conducts periodic *EnergyPlus* workshops in Prospect Heights, IL (a northwest suburb of Chicago). More information is available through URL:

<http://gard.com/training.htm>

General questions about Energy Plus workshops and training may be directed to:

EnergyPlus-Training@gard.com

Available Support

Support for EnergyPlus users is currently available through e-mail at:

EnergyPlus-Support@gard.com

An *EnergyPlus* support group is also available on Yahoo at web site:

http://www.groups.yahoo.com/group/EnergyPlus_Support/

Members of the Yahoo support group can send messages to:

EnergyPlus_Support@yahoo.com